DOCUMENT RESUME

ED 231 699 SO 014 725

AUTHOR Koroscik, Judith Smith
TITLE Structural Information Retention in Visual Art Processing.
PUB DATE Apr 83
NOTE 9p.; Paper presented at the Annual Meeting of the American Educational Research Association (Montreal, Canada, April 11-15, 1983).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Art Education; Educational Research; Higher Education; *Recognition (Psychology); *Retention (Psychology); Undergraduate Students; *Visual Acuity; *Visual Arts; *Visual Discrimination

ABSTRACT

The accuracy of non-art college students' longterm retention of structural information presented in Leonardo da Vinci's "Mona Lisa" was tested. Seventeen female undergraduates viewed reproductions of the painting and copies that closely resembled structural attributes of the original. Only 3 of the 17 subjects reported having viewed a reproduction of the painting within the last several months; all others approximated the last viewing time as 1 to 15 years ago. Participants first viewed a series of 20 slides and indicated whether each was a reproduction of the original or a copy. They responded to one slide at a time and were not allowed to review slides previously shown or to change earlier responses. Next, subjects simultaneously viewed a set of printed reproductions and indicated which one was a reproduction of the original. Results indicate superior overall recognition of the original. When incorrect judgments were made, the copies selected were those judged by experts as those most closely resembling the original. The research suggests that memory often plays a key role in test response behaviors and ought not to be ignored when empirical measures of learning are designed. (KC)

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Structural Information Retention in Visual Art Processing

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A B S T R A C T

Structural Information Retention in Visual Art Processing

Judith Smith Koroscik
The Ohio State University

The purpose of this study was to compare recognition performance for two testing procedures (i.e., identification vs. discrimination tests) by examining the accuracy of nonart college students' long term retention of structural information displayed in two-dimensional visual art. Seventeen female undergraduates viewed DaVinci's Mona Lisa and copies that closely resembled structural attributes of the original. Subjects assessed whether each stimulus was the original or a copy of the Mona Lisa in (1) a slide identification test in which reproductions were presented and responded to singly, and in (2) a subsequent discrimination test wherein printed reproductions were viewed and responded to simultaneously. Analysis of the data indicated superior recognition of DaVinci's Mona Lisa from its copies on the discrimination test vs. the identification test. Results also indicated high levels of accuracy in subjects' overall recognition performance. It was found that when incorrect judgments were made and subjects identified copies as the original, the copies selected were those judged by persons with doctoral level training in the visual arts as most closely resembling the original Mona Lisa.

Structural Information Retention in Visual Art Processing

Judith Smith Koroscik
The Ohio State University

Educating student responses to works of art has become a major goal of art education in recent years. Research in art education has reflected this concern in its inquiries of art viewing processes. Previous investigations (e.g. Bengston, Schoeller & Cohen, 1978; Gardner, 1973; Rush, 1979; Rush & Sabers, 1981) have studied subject responses to works of art with identification tests in which artworks are viewed and responded to singly or with discrimination tests in which a target artwork is to be distinguished from a collection of other simultaneously presented works. Such testing procedures have often been used without consideration of memorial differences inherent in the task demands. Assessment of these differences seems essential in developing precise indices of viewing responses that are predisposed by memorial operations. The present study was designed, therefore, to compare recognition performance for the two testing procedures by examining the accuracy of nonart students' long term retention of structural information displayed in two-dimensional visual art.

Method

Design and Subjects

Two levels of Recognition Task (identification, discrimination) were manipulated as a within-subjects variable. Seventeen female under-

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Paper presented at the Annual Meeting of the American Educational Research Association, Montreal, April 1983.

Printed in U.S.A.

graduate elementary education majors enrolled in an art education course at The Ohio State University volunteered to participate in the experiment.

Materials

Slides were prepared of Da Vinci's Mona Lisa and eight copies painted after the original by sixteenth through twentieth century artists. The copies closely resembled the original painting but varied somewhat in color, proportion, and background detail. A total of twenty slides were prepared, two of each copy and four of the original Mona Lisa. The slides were grouped in two sets, one to be projected correctly and the other as right side up but reversed images. An extra slide of the original Mona Lisa was included in each set to measure the accuracy of subjects' responses in the identification-recognition task. Nine full-color printed reproductions of the original Mona Lisa and the copies (same as those reproduced as slides) averaging approximately 5 x 7 inches were prepared for the discrimination-recognition task.

The Mona Lisa was selected as a test stimulus on the basis of its general familiarity to untrained viewers of art (i.e. it was presumed all subjects had viewed a reproduction of the original painting at least once prior to the experiment), and because of the availability of numerous copies painted after the original. The fact that some copies more closely resembled structural attributes of the original than other copies was an additional factor in determining its suitability as testing stimuli.

Procedure

Identification recognition task. Subjects were tested in pairs while seated at a table positioned approximately 12 feet in front of a slide projection screen. Respondents were first asked to approximate

when they last viewed a reproduction of the original Mona Lisa painted by Leonardo da Vinci. They were then shown one of the twenty slides prepared for the identification task. All slides were independently randomized for each testing session where they were uniformly projected to the size of approximately 30 x 40 inches in a light controlled environment. Subjects were instructed to consider each slide precisely as shown and not to assume a slide was incorrectly projected. The respondents were asked to view each slide for 15 seconds and then indicate whether it was a reproduction of the original Mona Lisa by Da Vinci or a copy that resembled the original. Subjects were also asked to briefly specify in writing how the slide deviated from the original when it was judged to be a copy. Subjects responded to one slide at a time and were not allowed to review slides previously shown nor were they permitted to change earlier responses.

Discrimination recognition task. Immediately after responding to all twenty slides in the identification task subjects were individually asked to examine a set of printed reproductions which included the original Mona Lisa and the eight copies previously shown as slides. The prints were simultaneously presented to subjects in independently randomized arrangements. Respondents were instructed to take as much time as they desired to study the prints and then indicate which one was a reproduction of the original Mona Lisa. The respondents were next instructed to select a second and third print from the set of nine that best resembled their first choice.

Results and Discussion

An analysis of variance on subjects' consistent recognition of the original Mona Lisa or its reversed image on the slide identification task in relation to their recognition of the original Mona Lisa as their

primary choice on the discrimination task indicated: Discrimination Task > Identification Task, F (1, 16) = 5.67 at the $p < .05$ level. Such results suggest recognition performance benefited from the simultaneous presentation of stimuli in the discrimination process where subjects could continually compare one printed reproduction with another, and where each print could be continually compared with internally stored representations of the original Mona Lisa. Further analysis of discrimination scores indicated the accuracy of subjects' recognition of the original Mona Lisa as choice one or two on the discrimination task far exceeded that expected by chance alone, $\chi^2(1) = 7.12$, $p < .01$.

These findings are consistent with results of previous investigations by Koroscik (1982) and Koroscik & Blinn (1983) that found subjects to be highly accurate in recognizing structural information of artworks varied in levels of abstraction. Unlike the earlier investigations, however, the present study measured retention of structural information on long term bases as only three of the 17 subjects tested in the study reported having viewed a reproduction of the original Mona Lisa within the last several months. All others approximated the last viewing time as one year to 15 years ago, with the exception of one subject who claimed never having viewed a reproduction of the Mona Lisa. The latter individual adjusted this response after testing, but remained uncertain of just when she previously viewed the painting. Interestingly, despite this subject's inability to recall having seen the Mona Lisa when first asked, she successfully recognized the painting on both the identification and discrimination tests. Additional analyses of the data showed no significant differences in memory performance between subjects who stated having viewed the Mona Lisa many times vs. a few times prior to testing. However, the recency of subjects' viewing of the Mona Lisa was

found to be a significant variable in their performance on the slide identification task, F (2, 14) = 4.81, $p < .05$. The introspective nature of subjects' recency reports provoke question of their accuracy; however, these significant findings suggest subjects were either precise in their estimates or consistent in adjusting their recency reports to the degree of elaboration that characterized their stored representations of the painting.

An analysis of combined identification and discrimination task responses further delineated the accuracy of subjects' recognition performance. This was accomplished by tallying selection frequencies for each of the nine artworks shown as slides and prints in the study. Selection frequencies were then analyzed in relation to stimuli groupings made by three art experts. The art judges grouped artworks in terms of their structural similarity to the original Mona Lisa. Group 1 consisted of the original and the two copies that most closely resembled the original; Group 2 consisted of copies judged as resembling the original to a lesser degree; and Group 3 included copies ranked lowest in their resemblance to the original. The three art judges independently made identical groupings of the artworks. Results of the analysis indicated subjects' selections differed significantly for the three groups of artworks, F (2, 32) = 38.25, $p < .001$. Newman-Keuls analysis showed means ranked as follows: Group 1 > Group 2 = Group 3, all $ps < .01$, indicating again that subjects were extremely accurate in judging whether they were or were not viewing a reproduction of the original Mona Lisa. Apparently, when subjects made incorrect judgments and identified copies as the original, the copies selected were those judged as most closely resembling the original by art experts.

Conclusions

The present investigation examined the art viewing process by studying the accuracy of nonart college students' long term retention of structural information. Subjects demonstrated high levels of accuracy in their overall recognition performance, however, recognition scores were found to vary with task demands. Findings indicated that the identification and discrimination tests used in this study were disparate measures of visual art retention. Such findings suggest caution be used when generating experimental measures of art learning processes and when generalizing results from them. Memorial operations often play a key role in test response behaviors, are fundamental to all learning, and ought not be ignored when empirical measures of learning are designed. Art education research might benefit by further examining the function of memory in specific testing procedures and in general art viewing processes.

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